

PRIVATE INVESTMENT AND POLITICAL INSTABILITY: EVIDENCE FROM NIGERIA

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Abstract

It is a widely held opinion that the resumption of growth in Africa will require, among other things, an increase in investment, which will have to come primarily from the private sector if growth is to be efficient and sustained. Using a simple neoclassical investment model, we examined the impact of political instability on private investment. The OLS estimates indicate that political instability does not have any significant direct impact on private investment. We recommend that a political framework that does not negatively affect aggregate spending will be favourable to private investment boom.

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1.Introduction

It is a widely held opinion that the resumption of growth in Africa will require, among other things, an increase in investment, which will have to come primarily from the private sector if growth is to be efficient and sustained (Khan and Reinhart 1990). However, recent theoretical and empirical studies tend to suggest that reviving private investment may prove difficult unless concerted efforts are made towards restoring consistency and stability in macroeconomic policy environment of business (see Pindyck 1991; Metcalf and Rosenthal, 1995 among several writers who have brilliantly discussed these issues). One major source of macroeconomic policy instability is

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political instability/uncertainty. Political instability is defined in different ways depending on the indices that lend themselves to empirical analysis. For empirical purposes political proxies may not be adequately distinguished from expectations about movements in some macroeconomic aggregates such as exchange rate. But this is seen as too narrow a conceptualisation of the role of politics if one sees it as "*the presence of conflict between objectives of investors and governments*" (Gibson and Tsakalotos, 1993).

Studies generally seek to capture the impact of discrete political events rather than the political stability of the system over the long run. This is because the development of political proxies to aid economic research is notoriously difficult. Political indices are by their very nature qualitative and their use in (regression) analyses is perhaps more valid with respect to their sign rather than to the magnitude of the coefficients. The discrete political events usually focused on include government instability (revolutions and coups), rapid government turn over, unstable incentive frameworks, social unrest, fundamental uncertainties about property rights, political assassinations and executions, election crisis and violence, etc. (see, for instance, Brunetti and Weder 1997).

The object of this study is to examine the impact of political instability, using some selected indices, on the behaviour of private investment in Nigeria. The rest of the study is arranged as follows. Section 2 dwells on the behaviour of private investment in Nigeria since 1960. The literature on private investment is discussed in section 3. A core model of private investment is presented in section 4. An extended model to capture political instability is estimated and discussed in section 5. The study is concluded in section 6.

2. Investment Behaviour in Nigeria.

At the end of 1960, gross capital formation (GCF) in Nigeria stood at 258.2 million Naira of which the private sector accounted for 135.2

million Naira or about 52.0 per cent of total GCF¹. By 1963, out of the total GCF of 354 million Naira, the private sector accounted for about 227.2 million Naira or 64.0 percent of total. Within this time frame, the role of the public sector in economic activity was minimal. This was a carry over effect of the colonial era where the government concentrated more on governance and security. Real GDP which stood at 1962.6 million Naira in 1960 rose to 2243.0 million Naira in 1963 which represents an increase of over 14.0 percent. Over the years, a key factor to the erratic economic performance of the Nigerian economy had been the behaviour of aggregate investment expenditures (see survey by Uchendu, 1993). In the early 1970s, the positive external shocks in the form of increased oil prices generated massive savings and created investment booms (Ikhide, 1994). Investment expenditure when measured in current prices increased at an annual average rate of 55.0 percent between 1970 and 1975.

In the 1960s the government encouraged domestic banks to give a larger proportion of their domestic credit to domestic firms. Hitherto, credit to firms was largely externally financed. It was in 1963 that the government itself expanded rapidly its domestic credit. Between 1963 and 1966, nominal GDP rose from 2745.8 million Naira (1963) to 3374.8 million Naira (1966), while real GDP rose from 2825.6 million Naira to 3044.8 million Naira (at 1962 factor cost). The evidence shows that real GDP grew by about 8.0 percent between 1960 and 1966 while total GCF rose from 354 million Naira in 1963 to 485.2 million Naira in 1966. The share of the private sector moved from 64 per cent to 63 percent in the corresponding period. Generally, between 1960 and 1966, the economic and political climate were quite stable, calculable and, hence, favourable to growth and capital formation (Emenuga 1996). Between 1967 and 1970, investment and growth data on Nigeria were quite unreliable because of the civil war. For instance, data reported for 1967-69 did not include the Eastern region of the country. However, the war brought to fore the role of the Public sector in economic activity. Reported series for real GDP and GCF all declined. However, the

1 Most of the Figures quoted here and in the next section are from various editions of the FOS Digest of Statistics and Annual Abstract of Statistics.

private sector still averaged over 60 percent in investment expenditure over this period.

Many significant events before 1985 affected the economy and most especially investment spending, none more importantly than the management of oil revenues (Omoruyi 1995). The positive oil shocks of 1973/74 and 1979 multiplied the terms of trade more than five times between 1973-81 (World Bank, 1993). The spending of the oil revenue drove real per capita income in 1987 prices up from 1,300 Naira in 1972 to nearly 2,900 Naira in 1980 (in current US\$ of the time, from US\$ 280 to US\$ 1,100). The positive oil shocks generated massive savings and created investment booms. Investment expenditure when measured in current prices increased at an annual average rate of 53.0 percent between 1970 to 1975 period but the highest rate of growth was attained between 1974 and 1975 when capital formation reached a peak growth rate of 74.1 percent within a single year. The oil windfalls of the 1970s changed the sectoral composition of the GFCF in favour of the government. The government increased participation in the economy based on the believe that industrialisation is the engine of economic growth, and key to transforming the traditional economy. The view was made possible because government was the major beneficiary of the windfall. Various five-year development plans were drawn and they emphasised investment in large (state run) projects.

Since 1974, the public sector had been controlling a higher proportion of GFCF. By 1976, the public sector controlled more than three times the share of private sector. As a share of the GDP, the private sector contributed less than an average of 3.0 percent in the 1980s, as against an annual average of 8.8 percent in the period between 1973 and 1980 (see chart 2). The contribution even grew worse as the private sector could only contribute a paltry 0.2 percent of the GDP in 1993 in terms of investment-GDP ratio.

Most of the public sector investment had taken place in the industrial core projects (ICP) like Iron and Steel plants, Fertiliser plants, Liquefied Natural Gas (LNG) and other projects. Like the

earlier years, building and construction continued to contribute the largest to GCF. By 1973, building and construction had attained a share of 72.7 percent of the GCF with a value of 4976.6 million in 1984 Naira. This large share was explained by the fact that there was the need for an extensive reconstruction of facilities damaged by the civil war and the implementation of the large construction programmes of the Federal Government, especially the construction of Federal Highways. The fall in oil revenue between 1980 and 1986 left the economy with a highly capital intensive production structure that cannot pay for new, higher level of imports. Misallocation of resources in agriculture also included the construction, but not completion, of huge irrigation dams, which drew capital into agriculture, but produced few production benefits. In response to these distorted domestic terms of trade, the government engaged in fertiliser and interest rate subsidies. Market interest rates were pegged below their equilibrium rates. With further collapse in oil prices in 1986, the government adopted a far reaching economic reform programme which combined exchange rate and trade policy reforms aimed at revitalising the non oil economy with stabilisation policies designed to restore price stability and balance of payments equilibrium (see Emenuga 1996; Uchendu 1993).

Given the increasing share of public capital formation in total GFCF, the reforms were designed to emphasise downsizing the public sector and improving the efficiency of public asset management. Import licenses and the agricultural marketing boards were eliminated, price controls were lifted, and the deregulation of the financial system was initiated. The restructuring of domestic production and the liberalisation of the incentive regime led to a resurgence of agriculture and manufacturing, hence, real GDP started an upward journey again. The average nominal tariff level was lowered from 33 to 23 per cent, and the tariff structure was simplified. Most prices within the economy were decontrolled.

The immediate effect of these reforms was to restore the incentive to export and increase the profitability of private investment. Remarkable increases were recorded in investment (though largely public) in the last decade following the inauguration of an enabling

environment for investment. For instance, in 1988, the Federal Government issued an industrial policy statement outlying, among other things, a major liberalisation of the rules governing foreign participation in new enterprise in Nigeria with up to 100 percent permitted in most manufacturing activities. Besides, the Industrial Development Coordinating Committee (IDCC), an inter- ministerial body, was set up to become a one-stop approach centre for new ventures in order to reduce delays in receiving approvals for establishing an industry.

Even so, the high inflation, high interest rates and persistent depreciation of the Naira exchange rate in the last few years could be described as having constituted serious disincentive to new private investment. (Omoruyi, 1995).

3. Review of Relevant Literature.

3.1. The Traditional and New View on Investment.

In the early literature on explaining aggregate investment, a distinction was made between explaining the desired capital stock and explaining the rate of investment (for a fuller discussion see Abel, 1980). The early neoclassical investment theory of Jorgenson (1963) explains the desired capital stock as the outcome of a firms profit maximisation problem. Here, the desired capital stock is derived as a function of the demand for *output* and the *rental cost of Capital*. The adjustment from actual to desired Capital is specified as an ad hoc lagged adjustment. The Keynesian accelerator model, on the other hand, argues that the rate of investment spending is determined by the *rate of change of output*. Underlying this is the notion that the rate of change of output captures the expected future capacity requirements based on extrapolative expectations of past trends.

Lucas (1967) and Treadway (1969), amongst others, modified the neoclassical investment theory by introducing the assumption that capital is costly to adjust. Hayashi (1982), following this literature, demonstrated the relationship between this approach and Tobin's q theory of investment. Tobin (1969) argues that aggregate investment spending on additional capital assets will vary positively with q - the ratio of the market value of business capital assets to the replacement

value of those assets. Tobin asserts that q can be used as a qualitative measure of the market's incentive to invest. If q is greater than unity, a favourable investment climate is indicated and investment spending is encouraged; conversely, a q well below unit discourages investment spending.

Variables representing liquidity and finance constraints have, also, appeared frequently as determinants of business investment spending, especially in the short-run (Meyer and Kuh 1957). Chirinko and Schaller (1995) provide a good explanation of this "*Cash flow*" model. According to the cash flow model a firm first commits its retained earnings to financing its capital budget. Only after internal cash flow is exhausted does the firm seek external debt or equity financing. Since internal cash flow serves as a measure of profitability and as an index of the firm's capacity to attract external financing, the amount of the firm's investment is postulated to depend on its available cash flow. This is in contrast with the neoclassical theory of investment, as expressed by Keynes (1936) or Jorgenson (1963), which focuses on the *net present value of the expected stream of returns from alternative uses of funds*. Relevant variables include: the cost of a project; and expected future prices, costs and sales. In both developing and developed countries, accelerator effects have proved to be empirically important e.g. Greene and Villanueva, 1991). Within the neoclassical model these effects may be interpreted as reflecting the impact of current output growth on future expectations of demand.

In general, the (flexible) accelerator, cash flow, neoclassical and Tobin's q models use directly *output, cash flow, market value, prices and/or taxes* as determinants of investment expenditures. A class of models is the time series/autoregressive models that regress investment on a series of previous investment expenditures.

In recent years, a number of economists have argued that traditional rules for choosing the appropriate time to make investments ignore important costs. Because these costs are not considered, the traditional rules advocate investing at a lower rate of return threshold than is optimal. The theory underlying these additional costs can be characterised as a "*new*" view of investment, (see Pindyck 1991; Metcalf and Rosenthal, 1995 among several writers who have brilliantly discuss these issues).

The basic idea is that when investments have the characteristics of *irreversibly, uncertainty and flexibility* then the new theory will suggest different investment strategies than the old theory. Irreversibility, in this context, means the existence of *sunk* costs (i.e. set up costs of investment that cannot be recouped if the piece of capital is later resold). An irreversible investment is permanent. It cannot be undone regardless of the return that ultimately is realised. Uncertainty refers to the possibility of different future returns from this investment. Because of uncertainty about future returns, the investment ex post may provide a low (possibly negative) rate of return. Flexibility means that investors have some choice about the timing of the investment. Flexibility in timing provides an opportunity to postpone the investment and see if more information comes along that helps in determining if the investment will provide a high rate of return ex post.

Hence, the net present value of an investment project at time t may be positive, but if there is expected to be a flow of information in the course of period $t+1$, which reduces that uncertainty, then the optimum strategy could be to wait until some of this uncertainty is resolved. If the outcome turns out to be unfavourable, the investment project can then be abandoned. In other words, taking the option of waiting may be regarded as investing in information acquisition. Consequently, uncertainty may lead to the postponement of investment decisions rather than a straightforward abandonment of projects.

3.2: The Measures of Political Instability

Campos and Nugent (2000) summarized the different measures of socio-political instability in the literature into two, namely: those that stresses regular and irregular government transfers, and those that are much harsher, such as revolutions, *coups d'Etat*, civil wars and political assassinations. In Mankiw's (1995) study, political instability was measured by the frequency of revolutions, coups, or wars, and is negatively related to economic growth. Likewise, Persson and Tabellini (1999) measured Political instability by more frequent regime changes, or political unrest and violence, and this is

also significantly and negatively correlated with economic growth. Their study utilized a cross-country data.

Barro and Lee (1993) in their study measured political instability by the numbers of political assassinations per million people, revolutions and successful *coups d'Etat* while Chen and Feng (1996) and Jaegger and Gurr, (1996) among others used measures such as competitiveness and regulation of political participation; regulation, competitiveness, and openness of executive recruitment; and the legal (*de jure*) and operational (*defacto*) independence of the chief executive. Fosu (1992) included the concept of elite instability, which he defined as comprising for instance coup d'Etat as well as political plots, while Berthélemy, Kauffmann, Renard and Wegner (2002) added some less dramatic events that are linked to social unrest like demonstrations and political violence. In line with these studies, Campos and Nugent (2000) added that measures like strikes, demonstrations without violence or deaths, regional and internal conflicts, free press, etc., could also be used. Their study emphasized that these measures is capable of capturing the extent of even subtle changes in both legal and actual practice. This is given the fact that political actors and processes are to be subject to systematic regulation. The less regulated are such actors and processes, the greater is the potential for social and political change (and the higher the value of this socio-political instability index).

Campos and Nugent (2000) also warned that there may be overlaps in these measures and these overlaps (including irregular government transfers) does little to diminish the different intensities that each attaches to "instability." For instance while some measures constrain it to relatively tame phenomena, others places it closer to social chaos. In order to recognize both views, Campos and Nugent (2000) constructed two measures of socio-political instability, one capturing the more severe and the other the less severe forms of socio-political instability. Their measures of severe socio-political instability were similar to the measures used by Barro and Lee (1993) while those for moderate socio-political instability are similar to the measures used by Chen and Feng (1996) and Jaegger and Gurr (1996).

3.3: Political Institutions, Private Investment and Growth

Dixit and Pindyck (1993) shows that when one assumes that investments are irreversible, firms can be prompted to delay or forego investments out of the fear that the economic environment might change for the worse. For Stasavage (2000), irreversibility implies that downward adjustments in capital stock are more difficult to make than are upward adjustments. And as discussed by Serven (1998), in order to demonstrate a negative link between uncertainty and investment one needs to assume not only irreversibility but also either risk aversion, imperfect competition, or decreasing returns to scale.

Most empirical studies in the literature on determinants of private investment provide support for the claim that higher uncertainty is associated with lower levels of private investment (see Stasavage (2000); Serven and Solimano (1993) and Serven (1998, 1997)). Stasavage (2000) mentioned that irreversible investments might be subject to a credibility problem whereby a government has an incentive to change taxes or regulations *ex post* with the knowledge that investors cannot easily withdraw. For instance, the well-known time-consistency problem in capital taxation exists even for governments, which are social welfare maximizers. A proposed solution to this problem is for voters to strategically delegate to an elected representative who has a greater share of her assets in the form of capital than does the median voter in society (Persson and Tabellini 1994).

Furthermore, Stasavage (2000) warned that the credibility problem in investment is further complicated by the fact that firms are unlikely to have complete information about the preferences of any individual government decision maker. Instead, investors will have to make decisions based on their prior beliefs about these preferences. Under these conditions, the presence of political institutions characterized by multiple veto points (multiple decision makers in government) can help minimize credibility problems, to the extent that the greater the number of veto points, the higher the probability that at least one veto point will be controlled by an actor who, because of the assets they or their supporters own, will oppose *ex post* opportunistic changes in policy.

Stasavage (2000) defined a veto point² as a political institution, the holder of which has the power to block a proposed change in policy. Multiple veto points can be created by constitutional provisions, which specify, for example, that multiple chambers of a legislature must approve any changes in laws. Multiple veto points can also exist as a consequence of electoral rules such as proportional representation, which favor the development of coalition governments. In coalition governments any one member of the coalition may be able to veto a policy proposal by threatening to withdraw from the government if its demands are not satisfied.

Empirical studies suggest a significant negative correlation between political instability and economic growth (Barro, 1991, Alesina, Özler, Roubini and Swagel, 1996, Azam, Berthélemy and Calipel, 1996). Guillaumont, Guillaumont and Brun (1999) goes even further, showing that political instability combined with trade instability are the main factors behind the poor economic performance of African countries on 1970-1990.

Berthélemy, Kauffmann, Renard and Wegner (2002) stated that in a context of high instability, politicians tend to avoid structural reforms and lead wait-and-see policies instead in order to limit disagreement with the population and the other political parties. A government can also choose to pursue the same economic policy in spite of all the evidence, in order to defeat its opponents. Such schemes have been developed in the political economic literature by Alesina and Tabellini (1989), Cukierman, Edwards and Tabellini (1992) and Ozler and Tabellini (1991). Following the same perspective, Clague, Keefer, Knack and Olson (1996) consider that short-term perspectives are not likely to help policy makers keep their commitments, while Murphy, Shleifer and Vishny (1991) and Terrones (1990) underline that a government threatened by instability may be tempted to use corruption to insure the loyalty of the bodies that might help it to remain in power like the police, the army, the administration.

2 See Tsebelis (1995) for a survey of political and electoral institutions, veto points, and their effect on policy making

The negative correlation between political instability and growth can be explained through impaired production factors accumulation and efficiency, as underlined by Fosu (1992) and Dixit and Pindick (1994). Instability prevents political institutions from ensuring property rights, which in turn increases the probability that returns on investment are expropriated. As a result of higher risk, less investment is undertaken. Fosu (1992) shows that the same applies to human capital accumulation, as political instability might cause brain drain. In extreme cases of instability like revolutions or coups d'état, Fosu (1992) argues that breaks in the production process might occur, reducing directly the level of GDP. Moreover, the impact on production-factor accumulation can also be accompanied by a negative influence on their productivity Berthélemy, Kauffmann, Renard and Wegner (2002).

More specifically, few empirical studies tackle the interaction between the economic and the political spheres at a global level, taking into account the correlation between political factors. Among those frameworks, Tavarès and Wacziarg (1997) and Poirson (1998) confirm the negative correlation between democracy and political instability. Barro (1991) and Özler and Rodrik (1992) disclose a significant and positive correlation between political freedom and economic performance. By contrast, Alesina and Perotti (1994) cannot highlight any impact of democracy on growth, while Barro (1996) suggests a non-linear relationship, too much and not enough democracy being harmful to growth.

One possible reason for this is that democracy influences growth through numerous different channels, and these effects may have opposite signs (Stasavage, 2000). He stated that democracy might help to reduce uncertainty and raise private investment, but it also might generate increased pressures for redistribution, thus lowering allocative efficiency. Alesina and Perotti (1994) suggest another important reason for these inconclusive findings; dictatorships are a very heterogeneous group. Some authoritarian governments have pursued policies that promoted fast growth, some have tended towards kleptocracy while others, have at first been seen as models of stability, and subsequently, as prime examples of authoritarian misrule. In summary, Tavares and Wacziarg (1997) concluded that

the inconclusive impact of democracy on growth points towards an indirect influence.

In contrast, some empirical studies on growth, find a more statistically significant link between levels of private investment and overall levels of democracy, for example, Serven (1997) who used the the Gastil index of civil liberties find it to be significantly correlated with private investment in a panel data estimation which controls for other investment determinants. One reason for this result may be that focusing on private investment as dependent variable excludes some of the negative effects which democracy might have on economic performance via increased demands for redistribution. Focusing on private investment rather than overall investment is also preferable when considering the effect of uncertainty, because Aizenman and Marion (1996) have shown that in cases where high uncertainty leads to a decline in private investment, public investment often increases in compensation. But Serven (1997) noted however, that it is unclear exactly what phenomenon the Gastil indices are capturing.

Brunetti and Weder (1999) and Poirson (1998) both find that indices of the rule of law, bureaucratic quality, and corruption are significantly correlated with levels of private investment, controlling for other determinants. But Stasavage (2000) cautioned that though these findings have made a significant contribution to the literature, they have two shortcomings. First, indices such as the "rule of law" do not give any indication of which actual government institutions are associated with better provision of the rule of law. Second, measures of institutional quality may be subject to an endogeneity bias whereby their designers are influenced by overall economic performance in judging to what extent the rule of law, for example, is present.

4. The Model.

4.1. The Core Model³

The first problem the researcher isolate is the fact that there are numerous factors that affects investment in theory. In fact, Levine

3 The aim of this paper is not to build a full investment model for Nigeria; hence other determinants of investment are ignored.

and Renelt (1992) argue that these factors are well over fifty. It will become difficult to impose a generous lag structure on the models (or even to enter all the potential determinants) since our sample period is small (1960-97) giving that we will be using annual data. This problem becomes serious in the process of uncovering the long run dynamic adjustment process. Second, there does not exist a consensus theoretical framework to guide works on investment. However, a common feature of most studies on investment regressions is that the explanatory variables are entered independently and linearly. Hence, our modelling approach is to start first with a theoretical model which we call the *core model*. The core model follows the neoclassical line of thought that investment spending is determined by two broad elements: the accelerator and the user cost of capital effects (see for example Ibarra, 1995). The accelerator effect captures the relationship between capital accumulation and the rate of change of output. The user cost captures the degree of substitutability between capital and other inputs. Using a two-factor model of investment behaviour in the tradition of the Neoclassical theory - capital and labour, the firm maximises profit subject to a technology that can be represented by a CES production function:

$$Y = \gamma (K^\rho + L^\rho)^{\nu/\rho}.$$

Where γ is the efficiency parameter, ρ is the substitution parameter, and ν is the returns to scale parameter. The desired stock of capital that results from the first order conditions can be expressed as follows:

$$K^* = A[Y]^\phi [\omega_k/P]^{-\sigma} \quad (1)$$

where K^* is the desired capital stock; Y is real output, ω_k is the user cost of capital services, P is the output price, σ is the elasticity of substitution between capital and labour, ϕ is the elasticity of the optimal capital with respect to output, and A is a scale factor. The user cost of capital can be expressed as

$$\omega_k = P_k [(r-\pi)/(1+\pi) + \delta - \kappa - \tau z]/(1-\tau) \quad (2)$$

where P_k is the purchase price of a unit of new capital; r is the nominal financial cost of capital, usually a weighted average of the external and internal cost of funds; π is the rate of inflation; δ is the rate of depreciation of the capital stock; τ is the rate of corporate income taxation; κ is the rate of investment tax credits; and z is the present value of tax depreciation allowances.

Taking the differential of the logarithmic transformation of equation (1), and introducing costs of adjustment using a distributed lag function of the Koyck type, it is possible to get an expression that relates *current investment to past investment, to rate of change of output and to the rate of change in the relative price of capital services*. To transform these mathematical relations into an economic model of investment behaviour, it is the case that the actual rates of variation of output and the relative price of capital services are replaced by their expected counterparts. The result is the following equation:

$$I_t/K_{t-1} = \kappa_0 + \kappa_1[I_{t-1}/K_{t-2}] + \kappa_2 E_t[\Delta \ln(Y_t)] + \kappa_3 E_t[\Delta \ln(\omega_k/p_t)] + \varepsilon_t \quad (3)$$

$\kappa_1, \kappa_2 > 0; \kappa_3 < 0.$

Subset of variables like political instability index can then be added to equation (3) $E_t[.]$ can be proxied by an autoregressive process. However, actual values will be used in this study. Y_t will be measured by GDP. ω_k will be measured using interest rate corresponding to the 3-month Treasury Bills, the Gross Capital Formation Price index, the inflation rate corresponding to the CPI, and the corporate income tax rate. The rate of depreciation will still be assumed to be constant. The role of depreciation allowances and investment tax credits will still be ignored due to lack of information about these terms for Nigeria. However, it is unlikely that they might significantly alter the results. Denoting real output during time period t as Y_t , and letting the fixed capital/output ratio equal μ , according to the *accelerator model*, not only does the optimal capital stock K_t^* bear a fixed factor of proportionality to output,

$$K_t^* = \mu \cdot Y \quad (4)$$

But the capital stock is always optimally adjusted in each time period, implying that $K^* = K_t$.⁴ This formulation implies that the capital stock variable in equation (3) can be replaced by Y^5 . This is important since we do not have reliable estimates of the capital stock for Nigeria. A more rigorous way of transforming similar models can be found in Berndt (1991). Our estimating core model is writing as:

$$I_t/Y_{t-1} = \alpha_0 + \alpha_1[I_{t-1}/Y_{t-2}] + \alpha_2[\Delta \ln(Y_t)] + \alpha_3[\Delta \ln(\omega_{kt}/p_t)] + v_t \quad (5)$$

$$\alpha_1, \alpha_2 > 0; \alpha_3 < 0.$$

Lags of the independent variables will also be introduced in other to capture the dynamics involved in the determination of investment spending. However, because of the small sample size, we will favour the use of small lag lengths⁶. The dynamic version of equation (5) would be estimated. Our sample period is 1960 to 1997.

4.2. Empirics

The Preferred dynamic version of our core model is presented in Table 1. We observed that private investment as a ratio of GDP is explained by it one period lag value, one period lagged accelerator effect and marginally by user cost. However the sign on the coefficient of user cost was observed to be positive as against theoretical expectations. The three exogenous variables explain about 80 percent of the total variations in private investment share. The LM and ARCH tests (using 4 lags) do not show any significant evidence of serial correlation. The RESET test is used here as a proxy for test of (non-) linearity. We find no significant evidence that our linear specification is not adequate. The F-statistics is also found to be significant indicating a good overall fit.

4 This restriction is relaxed in the so-called flexible accelerator model. However, the same conclusion is derivable therefrom.

5 The parameter μ will be absorbed by the coefficients.

6 The Time series properties of these series could be found in Busari and Fashanu (1998).

Table 1: OLS Estimate of the core Model

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	.003524	0.006685	0.527216	0.6019
INV_GDP(-1)	0.899828	0.079037	11.38486	0.0000
DLNREAL_GDP(-1)	0.066175	0.032397	2.042658	0.0500
COST	0.041604	0.026371	1.577636	0.1251

R-squared	0.824489	Mean dependent var	0.072251
Adjusted R-squared	0.806937	S.D. dependent var	0.043411
S.E. of regression	0.019074	Akaike info criterion	-7.808675
Sum squared resid	0.010915	Schwartz criterion	-7.629103
Log likelihood	88.50357	F-statistic	46.97635
Durbin-Watson stat	2.195505	Prob(F-statistic)	0.000000

Note: INV_GDP is the ratio of private investment to total GDP, DLNREAL_GDP is the first difference of the natural log of real GDP and COST is the first difference of the log of user cost of capital.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.852673	Probability	0.505057
Obs*R-squared	3.942904	Probability	0.413788

ARCH Test:

F-statistic	0.141375	Probability	0.965141
Obs*R-squared	0.663588	Probability	0.955742

Ramsey RESET Test:

F-statistic	2.045944	Probability	0.163299
Log likelihood	2.317860	Probability	0.127896

Based on our preferred dynamic model, we linearly append our measures of political uncertainty. First we explain how these measures were constructed and utilised.

Constructing a Political Instability Index.

In constructing our measures of political index, six primary series were gathered. These are occurrence of coup *de tat* (successful or not); war (the Nigerian civil war); political assassinations and extra-

judicial executions; election crisis and violence; currency changes and the implementation of Firm nationalisation programmes (see Brunetti, and Weder 1997, among several authors that have followed this approach). For coup, we used actual number of occurrences. For the other variables we used a dummy, 1 for occurrence and zero elsewhere. Form these series, two major indices were then constructed. The first is a simple average of the sum of the various primary series and the second is the three period moving variance of the sum of the primary series.

Table 2 OLS Estimate of Investment model Using Average value

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	0.010501	0.008612	1.219258	
INV_GDP(-1)	0.892832	0.078450	11.38091	
DLNREAL_GDP(-1)	0.062241	0.032226	1.931395	
COST	0.049134	0.026779	1.834784	
POL_AVG	-0.035370	0.027939	-1.265967	

R-squared	0.833680	Mean dependent var	
Adjusted R-squared	0.810740	S.D. dependent var	
S.E. of regression	0.018886	Akaike info criterion	-
Sum squared resid	0.010343	Schwartz criterion	-
Log likelihood	89.41802	F-statistic	
Durbin-Watson stat	2.234247	Prob(F-statistic)	0.000000

Note: see note under Table 1. POL_AVG is the average value of our measures of political instability.

From Table 2 we could observe that the coefficient on the cost of capital is significant but still positive. Our measure of political instability is not significant even at 10 per cent. However we observed that the coefficient is negative indicating the negative but insignificant impact of political instability on private investment in Nigeria. When we used the three-year moving variance of the sum of the various measures we observed a positive but insignificant impact of political instability on private investment. Further more our measure of the user cost of capital has a positive but insignificant coefficient. In sum, political instability seems to have an insignificant impact on private investment behaviour. It should be noted that we tested the individual series to see their impact on private investment spending but none was individually significant. The occurrence of coup and the nationalisation dummy were the only series with negative coefficients.

Table 3 OLS Estimate of Investment model Using Variance of Sum

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	0.002627	0.006822	0.385076	0.7030
INV_GDP(-1)	0.882048	0.082649	10.67217	0.0000
DLNREAL_GDP(-1)	0.066643	0.032606	2.043882	0.0501
COST	0.037912	0.026945	1.407011	0.1701
POL_VAR	0.006972	0.008813	0.791080	0.4353
<hr/>				
R-squared	0.828196	Mean dependent var	0.072251	
Adjusted R-squared	0.804499	S.D. dependent var	0.043411	
S.E. of regression	0.019195	Akaike info criterion	-7.771202	
Sum squared resid	0.010685	Schwartz criterion	-7.546737	
Log likelihood	88.86652	F-statistic	34.94926	
Durbin-Watson stat	2.222213	Prob(F-statistic)	0.000000	

Note: see note under Table 1. POL_VAR is the three-year moving variance of the sum of our measures of political instability.

5. Conclusion

The insignificant impact of our measures of political instability is taken to imply that uncertainty in macroeconomic framework seems

to be more important than political uncertainty in determining the behaviour of private investment. Stability in macroeconomic framework implies a stable exchange rate system, low expected rate of inflation etc. The direct implication of this is that there seems to be more important factors outside political instability that drives private investment expenditure. Basically, the significance of the accelerator effect implies that policies that impair on aggregate domestic expenditure are likely to affect investment more than political instability. In effect, political instability can affect investment spending if it affects aggregate spending. The policy dimension to this is obvious. The political environment should be such that does not significantly affect the rate of change of domestic expenditure if private investment is to grow faster. Limitations relating to the data we used imply that above model must be treated with caution. Other approaches to constructing political series could also be an interesting area for further enquiry.

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